Meridian 1

Option 11C Survivability

Operation and Configuration Guide

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About this guide

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

IMPORTANT

To configure an Option 11C system for Survivability, follow the procedures described in this guide. Detailed technical information is contained in the *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100).

Survivability

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Overview of Survivability

This chapter provides a brief overview of the Option 11C Survivability feature.

Operating Modes

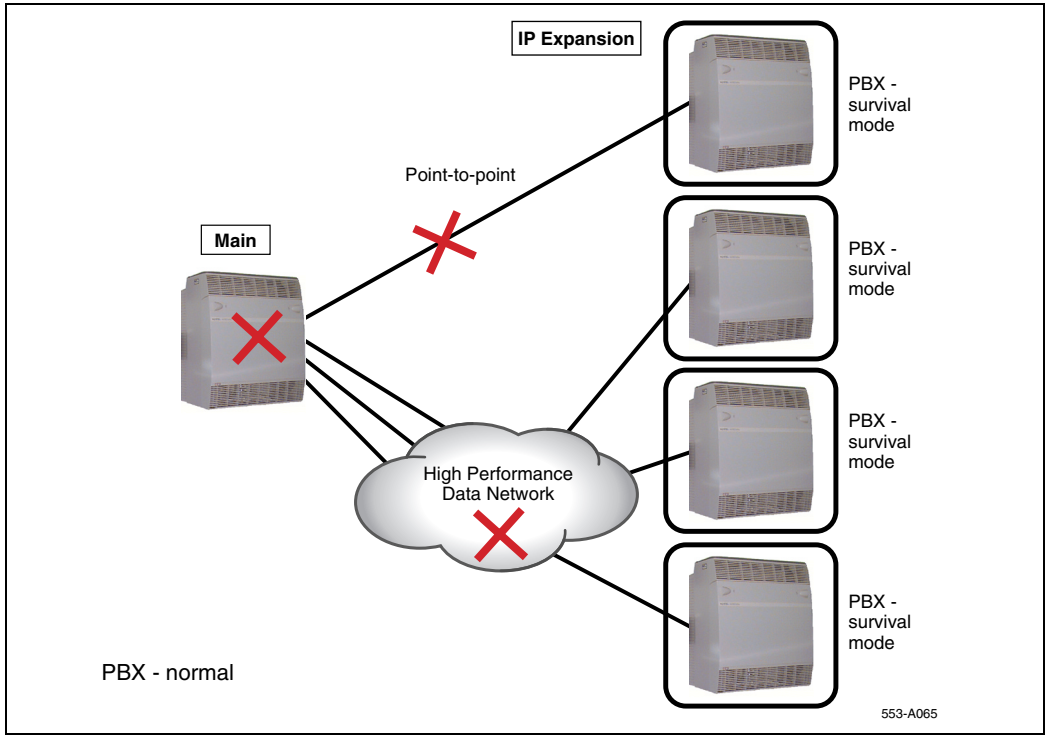
The following are the two modes of operation:

- **Survivability** is the ability of an Option 11C IP Expansion cabinet to perform Call Processing, for its local resources, when it is no longer connected to the Option 11C Main cabinet. This is referred to as Survival Mode.
- **Normal Mode** is when the local resources of an IP Expansion cabinet are controlled by the Main cabinet's Call Processing.

Minimum release required

Survivability is available for any Option 11C IP Expansion cabinet with X11 Release 25.3x and later software.

Figure 1
Option 11C Survivability



Incremental Software Management

The number of Survivable cabinets in a system is defined by an ISM parameter labeled SURVIVABILITY. The Survivability parameter is keycode activated.

Database synchronization between the Main cabinet and an IP Expansion cabinet occurs with a data dump from the Main cabinet, or with an IP Expansion cabinet start-up in normal mode.

Switchover to survival mode

A Survivable IP Expansion cabinet is able to restart after it loses communication with the Main cabinet, due to an outage of the Main cabinet or a failure of the link between the cabinets. During the restart procedure, the Survivable IP Expansion cabinet attempts to register with the Main cabinet. If a connection cannot be made with the Main cabinet within approximately two minutes, the IP Expansion cabinet switches to survival mode and acts as a stand-alone Option 11C.

Triggers

If Survivability is configured on a cabinet, the following two scenarios can trigger a switchover to survival mode:

- Automatic Switchover is triggered when the IP Expansion cabinet loses communication with the Main cabinet and the Switchover Time Out timer (SWOTO) expires. This can occur if there is a catastrophic failure of the Main cabinet, or the link is lost between the Main cabinet and the IP Expansion cabinet.
- Manual Switch Over is triggered with the Switchover to Survival (SOTS) command in Overlay 135.

Automatic switch over to Survival mode

When an IP Expansion cabinet, with survivability configured, loses communication with the Main cabinet, the IP Expansion cabinet automatically switches over to Survival Mode when the SWOTO timer expires.

The state of communication between the Main cabinet and the IP Expansion cabinet is monitored by a simple polling mechanism called a Heartbeat.

The following example illustrates the tasks performed by an Option 11C IP Expansion cabinet when communication with the Main cabinet is lost.

1. The IP Expansion cabinet attempts to re-establish the connection to the Main cabinet. After four re-connection attempts with a pre-defined delay between each attempt, the SWOTO starts.
2. The SWOTO expires after the time defined in Overlay 117.
3. The IP Expansion cabinet re-starts. As the IP Expansion cabinet is going through the re-start procedure, it attempts to register with the Main cabinet.
4. If a connection cannot be made to the Main cabinet, the IP Expansion cabinet comes up in Survival Mode.

Manual switchover to Survival mode

Manual commands are provided to allow a technician to force a switchover to Survival mode. These commands are only available on the Main cabinet. They can be used only if there is an established link between the Main cabinet and an IP Expansion cabinet. To manually switch over to Survival mode, use the SOTS command in Overlay 135.

IMPORTANT

A manually invoked switchover causes a restart of the IP Expansion cabinet.

After the SOTS command has been successfully executed, the IP Expansion cabinet remains in Survival mode until the Switch Back From Survival (SBFS) command is issued in Overlay 135 by the technician.

Switchback from Survival mode

A Survivable IP Expansion cabinet can switch back to normal mode after communication with the Main cabinet is restored.

The following two scenarios can trigger a cabinet in Survival mode, to return to normal mode.

- Automatic Switch Back (AUTOSB) allows an IP Expansion cabinet to automatically switch back from survival mode to normal mode as soon as the link with the Main cabinet is restored, and the SWOTO timer has expired. A restart is initiated on the IP Expansion cabinet. At the end of the system start, the IP Expansion cabinet is ready to operate in normal mode.
- Manual Switch Back allows a technician to force the system into normal mode by issuing the SBFS command. This command returns the system to normal mode after the SOTS command has been used.

Automatic Switch Back from Survival mode

When the Automatic Switch Back option is configured for a Survivable IP Expansion cabinet, the IP Expansion cabinet automatically switches back from survival mode to normal mode as soon as the link with the Main cabinet is restored and the SWOTO timer expires.

A valid database must be downloaded to the IP Expansion cabinet for this option to take effect. The database is downloaded or 'synchronized' each time a datadump is performed.

The AUTOSB command is available in Overlay 117:

CHG AUTOSB <cab#> <Switchback setting>
Where:
cab# = 1-4
Switchback setting = (YES) NO

When the switchback parameter is set to YES, the cabinet automatically switches back from survival mode as soon as the SWOTO timer expires. If switchback is set to NO, the cabinet remains in survival mode until a technician enters the SBFS command.

Switchover Timer

The timer is started on a Survivable IP Expansion cabinet as soon as the link with the Main cabinet goes up or down. When the timer expires, the switchover (or switch back) is triggered. The timer is used to avoid instability in the Operating Mode of the IP Expansion cabinet when the IP link with the Main cabinet becomes unstable.

The switchover timer is also used during the start-up of a Survivable IP Expansion cabinet in order to allow the cabinet to go into Survival mode if the IP Expansion cannot connect to the Main cabinet on system start-up.

When the link restores for an IP Expansion cabinet in Survival mode with AUTOSB configured, the SWOTO timer is started.

If the timer expires, a switch back is initiated to change from survival to normal mode. If a polling message is missed before the timer expires, the timer is reset.

If the link is detected as down again before the expiration of the SWOTO timer, the Operating Mode Manager stops the timer, and the IP Expansion cabinet remains in Survival operating mode.

Manual Switch back from Survival mode

After the SOTS command has been successfully executed, the IP Expansion cabinet remains in Survival mode until the technician issues the Switch Back From Survival (SBFS) command in Overlay 135.

Survivability notification

Telephones and Terminals

When an IP Expansion cabinet operates in survival mode, users are notified with a special dial tone and display information. Special text is also displayed on the remote TTYs connected to the IP Expansion cabinet.

Special Dial Tone

The dial tone provided to the telephones in survival mode is different from the dial tone for telephones in normal mode. This Flexible Survivable Dial Tone is provided with the Option 11C, however the user can alter the Flexible Survivable Dial Tone in Overlay 56.

The following table displays the prompts from Overlay 56 associated with the Flexible Survivable Dial Tone.

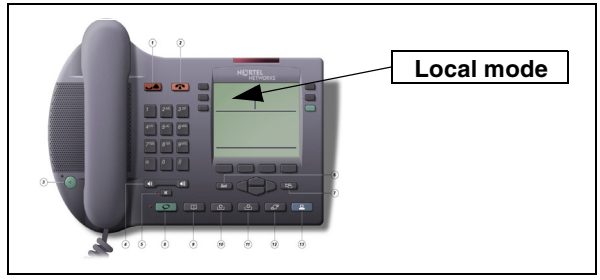
LD 56 – Flexible Survivable Dial Tone

Prompt	Response	Description
REQ	CHG	Change existing data.
TYPE	FTC	Flexible Tone and Cadence data block
TABL	0	Flexible Tone and Cadence data block number
...		
RING	(NO)	
HCCT	YES	Hardware Controlled Cadences and Tones
...		
SURV		Flexible Survivable Dial Tone
- XTON	0-(4)-255	Flexible Survivable Dial Tone Code
- XCAD	0-(253)-255	Flexible Survivable Dial Tone Cadence number

Display Information

During survival mode, telephones display the string “Local mode” in the first line of the display. Refer to Figure 2.

Figure 2
Display telephone



Remote TTY

Survivable IP Remote TTY

The three Serial Data Interface (SDI) ports on the Small System Controller (SSC) of an IP Expansion cabinet are available for use as additional system remote TTYs.

If the IP Expansion cabinet is configured for Survivability, the SDI ports of the IP Expansion SSC can be used during survival mode. In this mode, they function as a TTY connected to a stand-alone Option 11C. However, the TTY has no access to either Overlay 43 or Overlay 143. When in survival mode, the SDI ports of the IP Expansion cannot be used to access to the Main cabinet. Refer to Table 1 for SDI port numbering.

Table 1
SDI port numbering

Cabinet	Normal mode	Survival mode
Main	0, 1, 2	0, 1, 2
IP Expansion # 1	3, 4, 5	0, 1, 2
IP Expansion # 2	6, 7, 8	0, 1, 2
IP Expansion # 3	9, 10, 11	0, 1, 2
IP Expansion # 4	12, 13, 14	0, 1, 2

Special text, which is displayed on the TTY of the IP Expansion cabinet, indicates when the IP Expansion cabinet is operating in survival mode. This text informs the technician of the difference between the remote TTY's access to the Main cabinet in Normal mode and the IP Expansion cabinet in survival mode. The text displayed prior to login is as follows:

```
OVL111 0000 IDLE
TY 00 SCH MTC BUG 21:44
SURVIVAL MODE
```

The text displayed on the TTY of the IP Expansion cabinet after login is as follows:

```
TTY 00 LOGGED IN 21:44 3/10/1999 SURVIVAL MODE
OVL000 SURVIVAL MODE
```

Database synchronization

During Survival mode, Survivable IP Expansion cabinets use a copy of the database that was configured at the Main cabinet and previously downloaded to the Survivable IP Expansion cabinet. Use the Invoke Datadump Program (EDD) command at the Main cabinet, or upon start-up in normal mode to download the database.

Data can be changed on the IP Expansion cabinet while in survival mode, but new or changed data is lost when switched back to the Main cabinet. The local datadump (EDD) is supported only on the Main cabinet.

Data dump enhancements and new commands

With the introduction of Survivable IP Expansion cabinets, the EDD command is enhanced to first perform an EDD on the Main cabinet and then download the database files to each Survivable IP Expansion cabinet.

Before the file transfer, the Main cabinet verifies that the software release of the Survivable IP Expansion cabinet matches its own software release. If this check fails, the download operation is aborted for that cabinet.

The data files are loaded from the Expansion cabinet's primary drive (c:) to protected memory when a switchover to Survival mode occurs. The database files downloaded from the Main cabinet are used only when the Survivable IP Expansion cabinet switches to Survival mode.

DWL command (download)

If the download fails, the system prints a message that indicates on which cabinet the failure occurred. The download can be re-attempted using the new command DWL [<cab#>]. This command triggers the transfer of the database to the cabinet specified as a parameter, without performing another datadump on the Main cabinet.

The DWL command is available in Overlay 43:

DWL [<cab#>]
Where:
cab# = specified Survivable IP Expansion cabinet

Programming the cab# parameter is optional. If omitted, the database is downloaded to all connected Survivable Expansion cabinets.

EDD LCL command (local EDD)

The Invoke Datadump Program (EDD) command introduces the Invoke Datadump Program Local (EDD LCL) command. It performs a local datadump where data is dumped only on the Main cabinet. The databases on the Survivable IP Expansion cabinets are not updated. This operation is used when the database changes are tested by the technician prior to downloading them to the Survivable IP Expansion cabinets.

The EDD LCL command has the same effect as the former Option 11C EDD command. Its sequence of operations is as follows.

Prior to an actual dump, the Main cabinet performs a security check. If the security check fails, the datadump operation is aborted. If the security check passes, the existing database files on the primary flash drive are renamed with the extension ".bak". The data is then written to the primary flash drive.

When the database files in the primary flash drive are updated, data and patches are written to the internal backup flash drive (z:).

> ***Note:*** Overlay 43 and 143 are not available on an IP Expansion cabinet in Survival mode.

SWP, RES, RIB, and DAT commands for Survivability

To ensure the database synchronization on the Main cabinet and the Survivable IP Expansion cabinet(s), the Swap (SWP), Restore (RES) and Restore Backup (RIB) commands are modified to produce the same results on the Survivable IP Expansion cabinet(s), as on the Main cabinet.

The optional parameter, [<cab#>], allows the technician to select a specific cabinet in order to restrict the effect of the command to a specific cabinet.

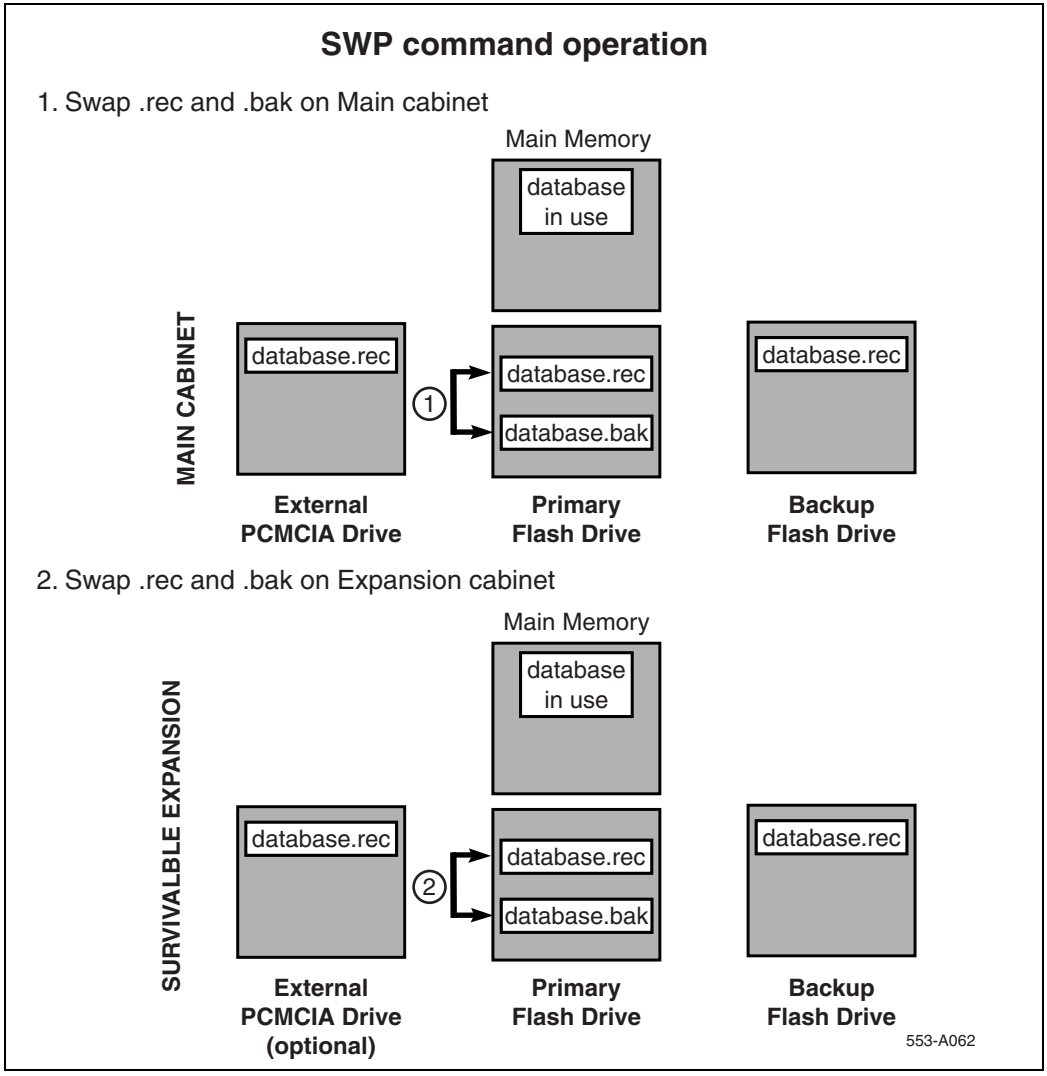
If no parameter is provided, the command is first performed on the Main cabinet. The technician is then prompted with a confirmation request. If <YES>, the command is performed on all Survivable Expansion cabinets.

As with the database download operation, preliminary security checks are performed by the Main cabinet against the Survivable IP Expansion cabinet(s) security ID and software release. If these security checks fail for any cabinet, synchronization is aborted for that cabinet.

SWP command

The SWP command is used to swap the regular and "*.bak" copies of the database on the primary flash drive. It restores the database to the state prior to the most recent datadump. Figure 3 illustrates the operation of the SWP command. Only one IP Expansion cabinet is shown for illustration purposes.

Figure 3
SWP command operation



RES and RIB Command

The RES command restores data from the Main cabinet's external PCMCIA drive to the Main cabinet's (c:) drive and all Survivable Expansion cabinets' (c:) drives. The RIB command restores data from the Main cabinet's internal backup flash drive to the Main cabinet's (c:) drive and from the Survivable IP Expansions cabinets' internal backup flash drive to the (c:) drive. These commands are illustrated in Figure 4 and Figure 5. Only one IP Expansion cabinet is shown for illustration purpose; however, the synchronization is performed sequentially on all IP Survivable Expansion cabinets.

Figure 4
RES command

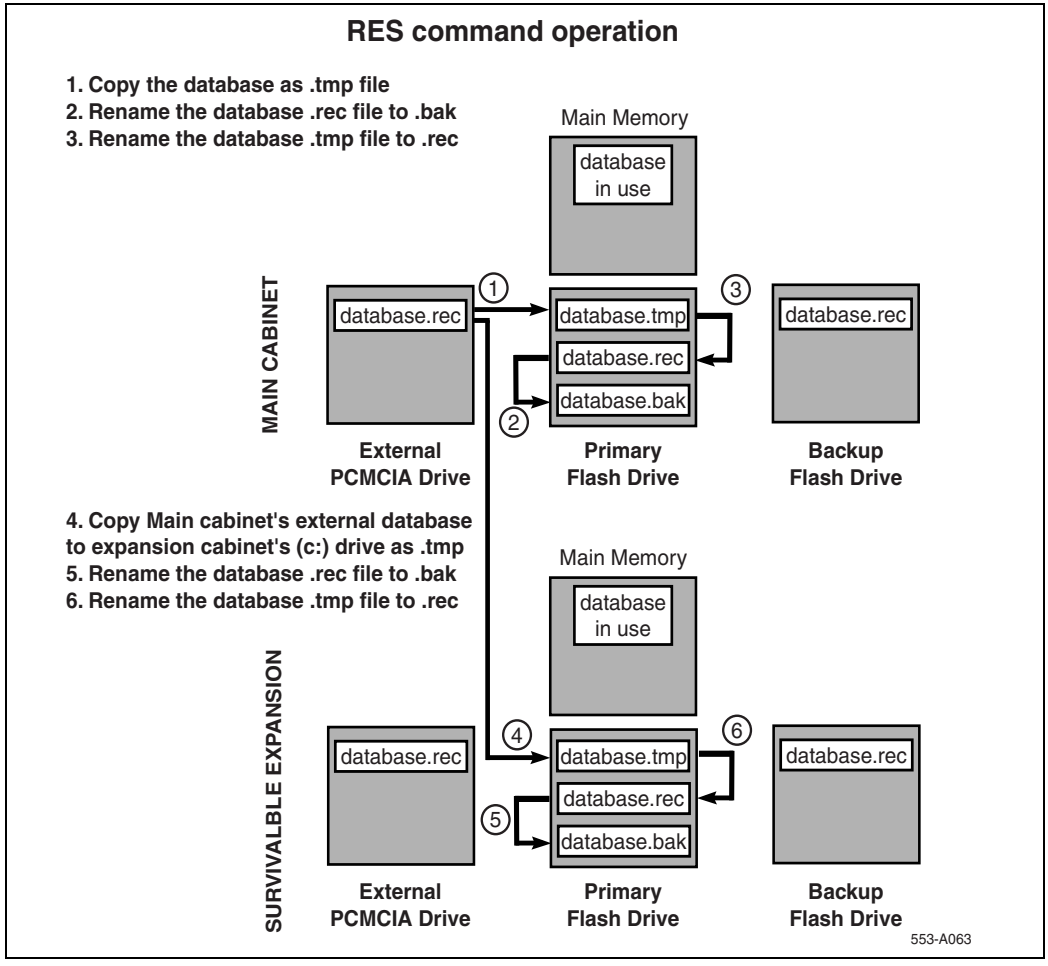
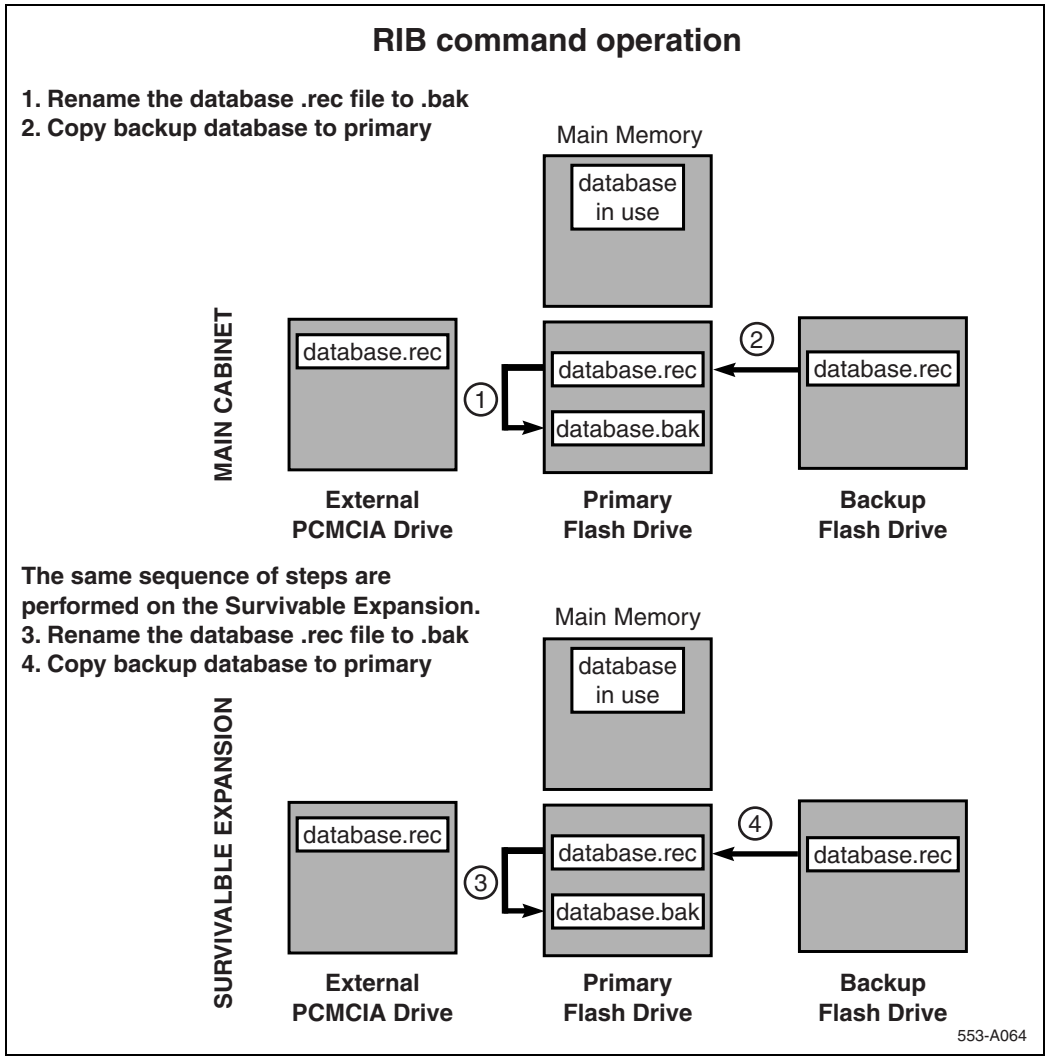


Figure 5
RIB command



DAT command

Use the DAT command to print the data issue and creation date of the Main cabinet's primary and backup databases, as well as those of the Survivable IP Expansion cabinets. The software release of the Survivable IP Expansion cabinets must match that of the Main cabinet.

The DAT command is available in Overlay 43.

LOCK and UNLOCK commands

The LOCK and UNLOCK commands are available from the Main cabinet.

The LOCK command locks an IP Expansion cabinet in the mode that it is in when the command is invoked. This does not require a restart of the selected IP Expansion cabinet.

- If the IP Expansion cabinet receives the LOCK command in normal mode, it goes into normal locked mode.
- If the IP Expansion cabinet receives the LOCK command in Survival mode, it goes into Survival Locked mode.
- When an IP Expansion is in normal Locked or in Survival Locked mode, no switchover (or switch back) is possible (automatic or manual) until the UNLOCK command is issued.

The UNLOCK command unlocks an IP Expansion cabinet. This does not require a restart of the selected IP Expansion cabinet.

- If the UNLOCK command is received in normal Locked mode, the IP Expansion cabinet returns to normal mode.
- If the UNLOCK command is received in Survival Locked mode, the IP Expansion cabinet returns to Survival mode.
- This command has no impact if it is received by an IP Expansion cabinet that has not been locked into either normal or Survival mode.

The LOCK/UNLOCK command can be used in any mode by a technician to keep an IP Expansion cabinet in the current mode, regardless of the state of the link to the Main cabinet. For example, a technician can issue a SOTS command. This forces the selected IP Expansion cabinet into Survival mode prior to restarting the Main cabinet. A LOCK command can be issued from the Main cabinet prior to a restart. This keeps the selected IP Expansion cabinet in Survival mode, until manually returned to normal mode. Manually returning to normal mode reboots the IP Expansion cabinet.

These commands are applicable to both modes and can be used to keep a cabinet in Survival mode after the Automatic Switch Back occurs.

The LOCK/UNLOCK command is issued in Overlay 135.

LOCK <cab #>
Where:
cab# = specified Survivable IP Expansion cabinet

UNLOCK <cab #>
Where:
cab# = specified Survivable IP Expansion cabinet

TN Mapping during Survival Mode

TN Mapping remains the same for both Normal and Survival modes. For example, the second card slot of the first Expansion cabinet is always card number 12.

Configuring for Survivability

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Configuring your system for Survivability

General information

Use this chapter to configure survivability on a new system, or add the capability to an existing Option 11C system. Before you configure Survivability, make sure you read and understand the information on the previous pages of this guide.

Configuring for Survivability

Follow the steps in Procedure 1 to configure Survivability on a new Option 11C system.

Procedure 1
Configuring for survivability - New system

1 Ensure that you have the proper hardware installed to support Survivability.

You can only configure Survivability on an IP Expansion cabinet. This means an IP Expansion cabinet that is connected to the Main cabinet with a 100BaseT or 100BaseF link. Please refer to the *Planning and Installation Guide* (553-3021-210) for further details.

2 Ensure that the Survivability ISM is set on your system for each cabinet that is to be configured as survivable

3 Configure the Survivability (SURV) capability.

Each IP Expansion cabinet must be separately configured to be survivable.

The SURV command is configured in Overlay 117:

CHG SURV <cab#> <Survival setting>

- cab# = 1-4
- Survival setting = (NO) YES

4 Configure the Automatic Switch Back parameter.

The Automatic Switch Back (AUTOSB) option allows a Survival IP Expansion cabinet to switch back from survival mode to normal mode automatically as soon as the link with the Main cabinet is restored and the Switchover Time Out timer (SWOTO) expires.

The AUTOSB command is configured in Overlay 117:

CHG AUTOSB <cab#> <Switchback setting>

- cab# = 1-4
- Switchback setting = (YES) NO

5 Configure the SWOTO.

Configure the SWOTO separately for each IP Expansion cabinet.

The SWOTO command is configured in Overlay 117:

CHG SWOTO <cab#> <value>

- cab# = 1-4
- value = 2 - (120) - 600 seconds

For point-to-point connection (cabinets that are not connected over a LAN), it is recommended that you set the timer to a low value to minimize service interruption.

End of Procedure

Printing Survivable cabinet parameters

The following Print commands, available in Overlay 117, print the Option 11C parameters and Survivability for all, or specified, IP Expansion cabinets.

PRT SURV cab
Where:
cab = 1 to 4

PRT CAB cab
Where:
cab = 1 to 4

Configuring trunks for Survivability

When properly configured, the IP Expansion cabinets can make outgoing calls, and in some cases, receive incoming calls when in Survival mode.

In order to make or receive calls, the Survivable cabinet must be configured with the appropriate trunks. The sections below detail some examples of configuration options that may or may not suit your specific system set up.

Option 1 - Dedicated DID/DOD trunks

Procedure 2
Configuring dedicated DID/DOD trunks for survivability

1 Configure each IP Expansion cabinet with incoming and outgoing DID trunks.

2 Configure the main cabinet with incoming and outgoing CO trunks.

These CO trunks will handle most external calls. The DID trunks not only provide direct inward access for certain users, but they also provide a means of outward dialing for users of the IP Expansion cabinets in Survivability mode. They can also be programmed as outgoing overflow trunks for the CO trunks in normal mode. Ensure that the Central Office has configured the DID trunks to work in this mode.

3 **Use the Network Alternate Route Selection (NARS), Basic Alternate Route Selection (BARS) or Alternate Trunk Route (STEP) prompt in Overlay 16 to program the CO trunks as outgoing overflow trunks in normal mode.**

Example: In Survival mode, incoming calls (non-DID) are still directed to the Main cabinet by the CO trunks. If the called non-DID DN exists in an expansion cabinet currently in Survival mode, the call is intercepted since it cannot be completed to its intended destination. The call is then given the intercept treatment that is configured for Maintenance Busy Numbers (MBNR) in the Customer Data Block. The options are busy tone, overflow tone, transfer to attendant, recorded announcement, or voice mail. If the intercept treatment is “Mail”, then the call is transferred to the called person's voicemail, such as Meridian Mail or CallPilot. The users of the IP Expansion cabinets that are in Survival mode can detect that they are in Survival mode by the Flexible Survivable Dial Tone and "Local mode" display on their telephones.

———————— *End of Procedure* ————————

Advantages:

- Users can make outgoing calls at any time.
- Users can still access their mailboxes in Survival mode if the Mail intercept feature is configured.
- The outgoing DOD trunks are used in both normal and survival modes.
- Users with DID numbers have direct inward access in both normal and survival modes.

Disadvantages:

- Non-DID users of the expansion cabinets cannot directly receive incoming calls in survival mode.
- The customer must purchase enough DID/DOD trunks to handle entire outgoing call volume in survival mode.

Option 2 - Outgoing-only, analog CO trunks

Procedure 3
Configuring analog CO trunks for survivability

1 Configure each IP Expansion cabinet with some outgoing-only, analog CO trunks.

2 **Configure the Main cabinet with incoming and outgoing CO trunks to handle most external calls.**

The operation is similar to Option 1 except that there are no inward DID capabilities. The “Mail” intercept feature can again be used in Survival mode to allow incoming calls to be directed to the called person's voicemail.

——————————— *End of Procedure* ———————————

Advantages:

- Users can make outgoing calls at any time.
- Users can still access their mailboxes in survival mode if the mail intercept feature is configured.
- The outgoing-only, analog CO trunks are more cost-effective than DID/DOD trunks.

Disadvantages:

- Users of the IP Expansion cabinets cannot directly receive incoming calls in survival mode.

Option 3 - Multiple, public-exchange Listed Directory Numbers (LDN)

Procedure 4
Configuring multiple, public-exchange LDNs for survivability

1 Configure the Main cabinet with incoming and outgoing CO trunks.

2 Configure the IP Expansion cabinets with incoming and outgoing CO trunks.

3 **Assign each cabinet a unique public LDN (referred to here as LDN # 0, LDN # 1).**

When an external caller dials LDN # 0, the CO trunks on the Main cabinet are accessed. When the external caller dials LDN # 1, the CO trunks on the first IP Expansion cabinet are accessed.

In normal mode, all the CO trunks are used for both incoming and outgoing calls. Unique LDNs are necessary to receive incoming calls when the system goes into Survival mode.

In Survival mode, incoming calls to the Main cabinet cannot be re-directed to an IP Expansion cabinet. The only way for an external caller to reach a user of an IP Expansion cabinet is through the cabinet's unique LDN. When an external caller dials this LDN, the switch must be configured to manually distribute the calls to the users on the cabinet. These alternatives are described below.

Distributing calls to the users

- Define one multiple appearance, Single Call Ringing (SCR) DN on at least one telephone on each cabinet.
- Assign this DN as the general Night DN for the system.
- Assign these telephones to users who will answer and redirect incoming calls in Survival mode for each cabinet.

The process for manually distributing calls to the user is as follows:

In normal mode, incoming calls to IP Expansion cabinet # 1 are processed by the Main cabinet's answering service (which could be an attendant, or Meridian Mail). When the Main cabinet's answering service is in Night mode, all the telephones with the multiple appearance DN ring for incoming calls. The calls can be manually redirected by any of the users assigned to those telephones.

However, when IP Expansion cabinet # 1 is in Survival mode, incoming calls to IP Expansion cabinet # 1 (by LDN # 1) are terminated only on IP Expansion cabinet # 1's telephone with the multiple appearance DN. Only the user assigned to IP Expansion cabinet # 1 is able to redirect these calls. The telephones with the multiple appearance DN on all other cabinets will not ring in this case.

——————————— End of Procedure ———————————

Advantages:

- Users can receive incoming calls at any time.
- Users can make outgoing calls at any time.
- The CO trunks on the IP Expansion cabinets function in both normal and survival modes.

Disadvantages:

- Users must inform their contacts of their new LDN.
- The LDN changes if a user relocates to an area serviced by a different cabinet.
- Each cabinet must have a method of redirecting incoming calls while in survival mode. Use one of the procedures above.

Implementing the Mail Intercept feature

When a system’s IP Expansion cabinets are in survival mode, the mail intercept feature allows incoming calls that cannot be redirected to an IP Expansion cabinet, to go to the called person's voicemail. The MBNR prompt in the Customer Data Block must be set to “mail”. Enter the Meridian Mail DN after 'MLDN' is prompted.

The MBNR and MLDN prompts are configured in Overlay 15.

Table 2
LD 15: Customer Data Block

Prompt	Response	Comment
REQ:	CHG	Change existing data block
TYPE:	INT	Change Intercept Treatment
CUST	0-31	Customer number
...		
MBNR	MAIL MAIL MAIL MAIL	
MLDN	xxxx	Mail DN

The following is a sample print out of the Customer Data Block (CDB). Use Overlay 21 to print the CDB.

```
>ld 21
REQ: prt
TYPE: int
TYPE INT_DATA
CUST 0
TYPE INT_DATA
CUST 00
ACCD OVF OVF OVF ATN
CTVN OVF OVF OVF ATN
MBNR MAIL MAIL MAIL MAIL
MLDN 3001
CTRC OVF NAP OVF NAP
CLDN NAP OVF NAP NAP
NINV OVF OVF OVF ATN
NITR OVF OVF OVF ATN
NRES OVF OVF OVF ATN
NBLK OVF OVF OVF ATN
```

```
MVFO OVF OVF OVF ATN
MFVN OVF OVF OVF ATN
MFCG OVF OVF OVF ATN
LCKT BSY BSY BSY BSY
RCLE ATN OVF ATN ATN
CONG OVF
DLT OVF
LLT OVF
DNDT BSY
REQ:
```

Supported applications

The Option 11C system has been provisioned to support the following applications and telephones, and their circuit cards (if applicable). Contact your system supplier or your Nortel Networks representative to verify that the functionality of the following is supported at this time:

- Attendant Console and PC based console
- Desktop Accessories
  - Power in line patch panel
  - Internet Telephone Switch Module
- Internet Telephone sets
- ITG line
- MIXX portfolio - MICB, MICA, MIPCD, MIRAN, MIVS
- MDECT
- OTM
- Remote Office

Administration Tools

The Optivity Manager (OTM) is compatible with the Option 11C system. OTM is an integrated suite of system management tools. Use OTM to configure, control, and manage your Option 11C system. OTM operates on a platform that is compatible with a standard IBM PC.

Refer to the *OTM User Guides* (553-3001-230, 553-3001-330, 553-3001-331) for information about the OTM application, its requirements, and how to install it for the Succession CSE 1000 system.

Peripheral Software Download

Peripheral Software Download (PSDL) is available from the Main cabinet in Normal mode only. PSDL is not supported on IP Expansion cabinets when they are in Survival mode.

ITG Line in Option 11C IP Survivable Cabinets

ITG Line card overview

The Meridian Internet Telephony Gateway (ITG) Line 2.0 card and later supports the i2004 Internet Telephone. The ITG Line card provides a communication gateway between the IP data network and Meridian 1 large and small systems. The i2004 Internet Telephone translates voice into data packets for transport using Internet Protocol (IP). The i2004 Internet Telephone uses the customer's IP network (TLAN) to communicate with the ITG Line card and the optional DHCP server. A Dynamic Host Configuration Protocol (DHCP) server is used to provide the required information needed to enable the i2004 Internet Telephone network connection and to connect it to the ITG Line card.

The ITG Line card plugs into an Option 11C Main or IP Expansion cabinet. Each card occupies two card slots. A maximum of two ITG Line cards are allowed in each cabinet.

The ITG Line Card communicates with the M1 CPU over the M1 private LAN (ELAN) using 10BaseT connectivity.

ITG Line card system requirements

The ITG Line card requires the following software:

- X11 Release 25.15 or later
- OTM 1.0 or later

Configure ITG Line data on OTM

When distributing ITG Line cards across different IP Expansion cabinets, the IP Expansion cabinets can be configured to each have their own node or to belong to the same node. If the IP Expansion cabinets are NOT in the same location as the Main Cabinet, then each IP Expansion cabinet must have its own node.

This is related to which Survival IP address is configured on the ITG Line cards. For a remote location, the Survival IP address of the ITG Line cards on that node = the IP address of the SSC on that node, while for the same building, all Survivable IP addresses on ITG Line cards are configured to only "one" IP Expansion cabinet's SSC IP address.

Please see below for some information on the two survivable mode options:

IP Expansion cabinets in separate nodes for ITG Line cards - Mandatory if IP Expansion cabinets are in a different location from the Main Cabinet:

- Trunks and Gateway channels are available in all IP Expansion cabinets.
- More administration is required as there is more than one node to manage.
- If ITG Line card fails, i2004 sets can register to another ITG Line card only if it is contained within that particular IP Expansion cabinet.
- Users cannot make i2004 calls from one IP Expansion cabinet to another.

IP Expansion cabinets in the same node for ITG Line cards:

- Trunks and Gateway channels only available for i2004 sets on one IP Expansion cabinet but can be used by all ITG Line cards.
- Less administration as there is only one node to manage.
- If ITG Line card fails, i2004 sets can register to other ITG Line cards (in different IP Expansion cabinets).
- Users can make i2004 calls from one IP Expansion cabinets to another.

Summary of steps to configure ITG Line 2.0 data on OTM:

Refer to *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) for a detailed description of these steps.

1. Manually add an ITG card node. It is mandatory that each IP Expansion cabinet have its own node if they are located in separate locations from the Main Cabinet. Refer to text above.
2. Configure ITG line card properties.
3. Configure DSP profile data.
4. Configure the Main Cabinet E-LAN IP address, Survivable IP Expansion cabinets E-LAN IP address and TLAN voice port.

5 Enter the Option 11C IP E-LAN address of the Main Cabinet.

Define the Survivable IP Expansion cabinet IP address in OTM. There is an extra field in OTM to configure the Survivable IP Expansion cabinet IP address and TLAN port. Use the same secondary IP address as the IP Expansion cabinet's E-LAN address. If the IP Expansion cabinet is non-survivable, leave the default value at "0.0.0.0".

Note: The E-LAN address of the Survivable IP Expansion cabinet entered must be on the same subnet as the Main Cabinet. If the IP Expansion cabinet is on a different subnet, use the VLAN concept to keep both E-LAN addresses on the same subnet.

6 Configure SNMP traps and E-LAN GW Routing table.

7 Configure security for SVMP access.

8 Configure the alarm notification features in OTM.

Summary of ITG Line card configuration on the Option 11C

The steps used to install ITG Line card on the Option 11C are similiar to those for any Meridian 1 large system. In addition to the procedures listed below follow the procedures provided in *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) and *Internet Terminals: Description* (553-3001-217). Where installation differs in the Option 11C IP Expansion cabinets, the details are provided in the following procedures.

1 Configure ITG Line card on the Option 11C Main and IP Expansion cabinets. Follow Procedure 5 on page 37 and Procedure 6 on page 38.

2 Continue with the procedures in *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) and *Internet Terminals: Description* (553-3001-217) for configuring ITG Line for Meridian 1 large and small systems listed below.

a. Configure bandwidth management zones (Overlay 117).

b. Configure ITG physical TNs (Overlay 14).

c. Configure virtual superloops for i2004 Internet Telephones (Overlay 97).

d. Configure i2004 Meridian 1 features (Overlay 11).

e. Configure i2004 Internet Telephone dedicated soft keys.

3 Configure ITG Line data on OTM.

4 Transmit ITG Line node configuration data from OTM to the ITG Line cards.

5 Upgrade the ITG Line card software and i2004 set firmware.

6 Assemble and install i2004 telephones.

7 Verify ITG Line operation in Survival Mode. Refer to Procedure 7 on page 43.

Configure ITG Line data on Option 11C Main and IP Expansion Cabinets.

When the ITG Line card is installed in the Main Cabinet, only one IP address is required. When the card is installed in a Survivable IP Expansion cabinet, two IP addresses are required. The first IP address is for the Main cabinet SSC. The second IP address is for the SSC in the Survivable IP Expansion cabinet that has the ITG Line card.

Each i2004 Internet Telephone configured on the ITG Line card must have the IP address of the Survivable IP Expansion cabinet configured as the second IP address. These IP addresses must be on the same subnet.

Use the following procedures to configure the Option 11C main cabinet and any IP Expansion cabinets.

Procedure 5
Configure the E-LAN IP address for the Option 11C active ELNK Ethernet interface on the Main cabinet, if not already defined.

1 Go into Overlay 117.

2 Create host entries with IP address on the ELAN subnet. Enter the following command:

NEW HOST <hostname> <IP_addr> <cab#>

- <cab#> = 0, for the Main cabinet.

3 Configure the ELAN Mask. Enter the following command:

CHG MASK <maskvalue> <cab#>

- <maskvalue> = xxx.xxx.xxx
- <cab#> = 0, for the Main cabinet.

4 Configure a new Routing Entry. Enter the following command:

NEW ROUTE <destination IP> <gateway IP> <cab#> <port#>

- <destination IP> is the ELAN IP address of ITG Line card on the Main cabinet
- <gateway IP> is the ELAN IP address of the Main cabinet
- <cab#> = 0 for Main cabinet
- <port#> = 0 for 10BaseT

5 Verify your IP address for the Ethernet. Enter the following command:

PRT ELNK

6 Activate New Host entry. Enter the following command:

CHG ELNK ACTIVE <hostname> <cab#>

- <cab#> = 0, for the Main cabinet.

7 Update the ELAN configuration. Enter the following command:

UPDATE DBS.

8 Reboot the Main cabinet for the changes to take effect or go into Overlay 137 and disable and enable the ELNK. Enter the following commands:

DIS ELNK

ENL ELNK.

End of Procedure

Procedure 6
Configure the E-LAN IP address for the Option 11C active ELNK Ethernet interface for a Survivable IP Expansion cabinet

1 Go into Overlay 117.

2 Create host entries with IP address on the ELAN subnet. Enter the following command:

NEW HOST <hostname> <IP_addr> <cab#>

- <cab#> = 1-4, for the IP Expansion cabinet

3 Configure the ELAN Mask. Enter the following command:

CHG MASK <maskvalue> <cab#>

- <maskvalue> = xxx.xxx.xxx
- <cab#> = 0, for the Main cabinet

4 Configure a new Routing Entry. Enter the following command:

NEW ROUTE <destination IP> <gateway IP> <cab#> <port#>

- <destination IP> is the ELAN IP address of ITG Line card on the IP Expansion cabinet
- <gateway IP> is the ELAN IP address of the IP Expansion cabinet
- <cab#> = 1-4 for IP Expansion cabinets
- <port#> = 0 for 10BaseT

To configure ITG Line for other Survivable IP Expansion cabinets, repeat steps 1-4.

5 Verify your IP address for the Ethernet. Enter the following command:

PRT ELNK

6 Activate New Host entry. Enter the following command:

CHG ELNK ACTIVE <hostname> <cab#>

- <cab#> = 1-4 for IP Expansion cabinets

7 Update the ELAN configuration. Enter the following command:

UPDATE DBS

8 Reboot the Main cabinet for the changes to take effect or go into Overlay 137 and disable and enable the ELNK. Enter the following commands:

DIS ELNK

ENL ELNK

———————— ***End of Procedure*** ————————

Continue the installation of the ITG Line card on Meridian 1 large and small systems. Refer to the procedures summarized in “Summary of ITG Line card configuration on the Option 11C” on page 36.

Configure ITG Line data on OTM

Refer to *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) and *Internet Terminals: Description* (553-3001-217) for a detailed description of the procedures listed below.

Summary of steps:

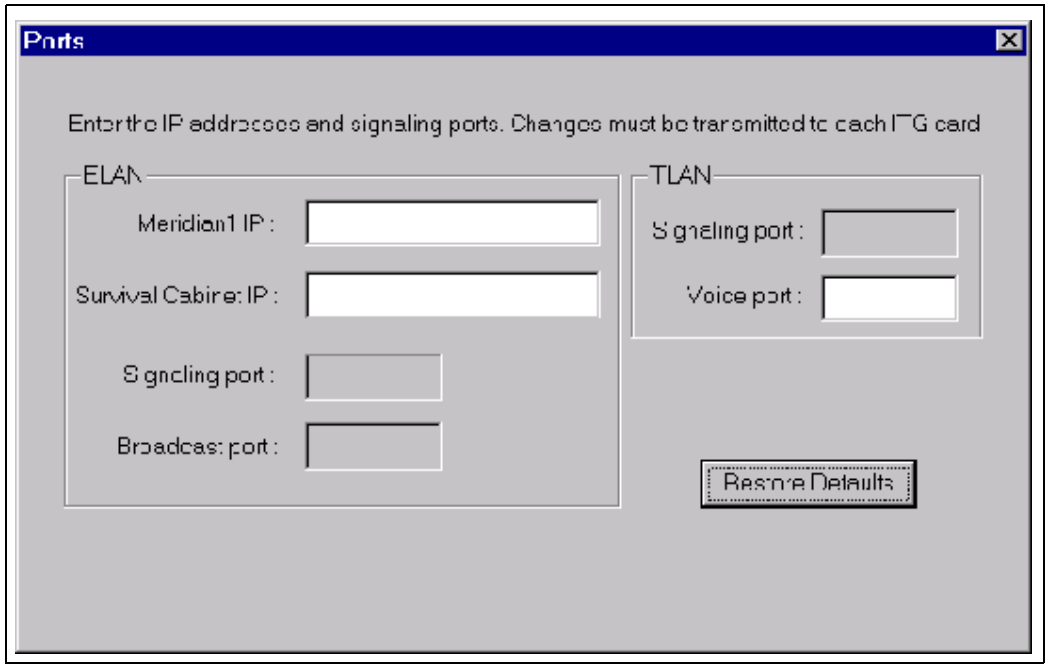
1. Manually add an ITG card node. Do not use this Node anywhere else. It is unique for this cabinet.
2. Configure ITG line card properties.
3. Configure DSP profile data.
4. Configure Meridian 1 Call Server ELAN IP address, Survivable cabinet ELAN IP address and TLAN voice port.

   Enter the Option 11C IP ELAN address of the Main cabinet.

   Define the Survivable IP Expansion cabinet IP address in OTM. There is an extra field in OTM to configure the Survivable cabinet IP address and TLAN port. Refer to Figure 6 on page 41. Use the same secondary IP address as the IP Expansion cabinet's ELAN address. If your IP Expansion cabinet is non-survivable, leave the default value at "0.0.0.0".

   Note: The ELAN address of the Survivable IP Expansion cabinet entered must be on the same subnet as the Main cabinet. If your IP Expansion cabinet is on a different subnet, use the VLAN concept to keep both ELAN addresses on the same subnet.
5. Configure SNMP traps and ELAN GW Routing table.
6. Configure security for SVMP access.
7. Configure the alarm notification features in OTM.

Figure 6
OTM Primary and secondary IP addresses



Transmit ITG Line node configuration data from OTM to the ITG Line cards

ITG Line node and card properties are configured in the OTM ITG IP Phones application and then transmitted to the ITG line cards. OTM converts the configuration data to text files and transmits files to the line cards. Refer to *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) and *Internet Terminals: Description* (553-3001-217). Complete the following steps:

1. Set the Leader 0 IP address from TTY connected to local RS232 maintenance port.
2. Reboot Leader 0.
3. Transmit the node and card properties from OTM ITG IP Phones application to Leader 0.
4. Reboot Leader 0.
5. **Transmit card properties to all cards in the node.**

Upgrade the ITG Line card software and i2004 set firmware

Before upgrading your software and firmware, check which version of card software and i2004 set firmware is currently installed. Compare this information to the latest versions available. To do this, access the Electronic Software Distribution (ESD) website. Refer to *Internet Telephony Gateway Line Card: Description, Installation, and Operation* (553-3001-204) and *Internet Terminals: Description* (553-3001-217) for additional information.

If you must upgrade the software, the preferred method of software delivery is directly from the ESD website. When Internet access is restricted or unavailable from the OTM PC, order the latest software on CD ROM, and insert the CD ROM into the CD ROM drive on the OTM PC.

Installation of i2004 Internet Telephone

Refer to *Internet Terminals: Description* (553-3001-217) for instructions on the installation of the i2004 Internet Telephone.

Verify ITG Line operation in Survival Mode

To verify the operation of an ITG Line card in an IP Expansion cabinet in Survival Mode, complete Procedure 7.

Procedure 7
Verify the operation of an ITG Line card in an IP Expansion cabinet in Survivable Mode

1 Go into Overlay 135 and use the SOTS command to force the IP Expansion cabinet into Survival mode.

The IP Expansion cabinet will reboot and come up in Survival mode.

When it is finished rebooting and in full operation, the ITG Line card on the IP Expansion cabinet reboots and comes back up communicating with the Survivable IP Expansion cabinet's ELAN.

2 Check the i2004 Internet Telephones and TTY:

- Local Mode is visible on the telephone display.
- The Flexible Survivable Dial Tone is apparent.
- Special text is also displayed on the remote TTYs connected to the IP Expansion cabinet as shown below.

```
TTY 00 SCH MTC BUG CTY     14:10
SURVIVAL MODE
OVL111 IDLE
```

3 Return to Normal Mode using the SBFS command in Overlay 135**.**

The IP Expansion cabinet and ITG Line card will reboot again.

———————————— ***End of Procedure*** ————————————

CDR retrieval from Survivable IP Expansion cabinets

Call Detail Recording (CDR) records are available from an IP Expansion cabinet that has entered into Survival mode. These records must be manually retreived when the cabinet returns to normal mode (from Survival mode) using the following XModem procedure.

CDR is only generated from the Survivable IP Expansion cabinet when the system is operating in Survival mode. The CDR files are deleted from the IP Expansion cabinet after a successful transfer to a PC.

The XCDR command, file retrieval for small systems in Overlay 143, transfers the CDR file from the Survivable IP Expansion directly to the PC connected to the Main cabinet.

Use the following procedure to retrieve the CDR files stored on the Survivable IP Expansion cabinets (one file per cabinet) using X-Modem :

Procedure 8
CDR Retrieval using XModem

1 Connect a PC to the main cabinet either remotely using a modem or directly using an SDI cable and a modem eliminator. Using a terminal emulation program such as Hyperterminal, establish a TTY session with the M1 through the modem or SDI cable.

2 Go into Overlay 143 on the Main cabinet from the PC. Enter the following command:

XCDR

3 The system prompts for the IP Expansion cabinet number. Enter the IP Expansion cabinet number on which the <dba.cdr> file is stored.

4 The system prints the following.

```
Getting CDR file for EXP_CAB <num>
Ready to transmit..."
```

5 Invoke the XModem protocol on the PC to receive the CDR file.

Use the Hyperterminal transfer function to receive the file using XModem prototcol. Rename the file to indicate which IP Expansion cabinet the CDR data is from.

Note: Use a file name that will not overwrite any DBA-specific files if DBA is used to retrieve CDR/Traffic files from the Main cabinet.

6 Parse the CDR file into the Main cabinet's database on the PC.

Refer to the OTM NTP's for how to retrieve CDR records for Billing applications.

End of Procedure

Meridian 1

Option 11C Survivability

Operation and Configuration Guide

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